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AUSGEGEBEN
AM 8. AUGUST 1921

REICHSPATENTAMT
PATENTSCHRIFT
— Nr 339777 —
KLASSE 65a GRUPPE 3

Porsgrunds Cementstöperi A/S in Porsgrund, Norwegen.

Verfahren zur Herstellung von Eisenbetonschiffen in der Lage kieloben.

Patentiert im Deutschen Reiche vom 27. November 1919 ab.

Für diese Anmeldung ist gemäß dem Unionsvertrage vom 2. Juni 1911 die Priorität auf Grund
der Anmeldung in Norwegen vom 11. August 1916 beansprucht.

- Die Erfindung betrifft ein Verfahren zur Herstellung von Eisenbetonschiffen in der Lage kieloben und besteht darin, daß der Schiffskörper auf einer als Ponton wirkenden mit lufterfüllten Räumen versehenen Verschalung geformt wird, die mit dem fertigen Schiffskörper vom Stapel läuft und ihn zunächst kieloben schwimmfähig erhält, darauf aber infolge Entlüftung der lufterfüllten Räume durch Eindringen von Wasser derartig beschwert wird, daß das angenähert bis zum Kiel gesunkene Schiff in labilen Gleichgewichtszustand gerät und sich selbsttätig in die aufrechte Lage wendet. Durch dieses Verfahren wird die Herstellung von Eisenbetonschiffen größerer Abmessungen erleichtert, weil das Umwenden, das bisher auf Schwierigkeiten stieß, leicht ausgeführt werden kann.
- Zur Erläuterung der Erfindung dienen die Zeichnungen, in welchen zeigen:
- Fig. 1 einen Querschnitt durch ein geformtes Eisenbetonschiff mit der Verschalung nach der Fertigstellung,
- Fig. 2 einen Längsschnitt in kleinerem Maßstabe,
- Fig. 3 bis 7 Querschnitte der Pontonverschalung mit dem Schiffskörper in verschiedenen Lagen nach dem Stapellauf beim Umwenden.
- 1 ist der fertig geformte Betonschiffskörper, 2 die äußere Verschalung, die auf die

senkrechten Seiten des Schiffskörpers beschränkt sein kann, 3 ist die innere ein Ponton bildende Verschalung, 4 der Boden oder Schlitten, auf welchem die Verschalung kieloben während des Formens aufruht, 5 sind luftdichte Längsschotten, 6 Luftauslaßlöcher im Schiffsboden und im Ponton.

Nach Fertigstellung des Schiffskörpers werden die äußeren Verschalungen entfernt, worauf die innere Verschalung mit dem Schiffskörper ohne den Boden 4 in das Wasser gelassen wird. Die Innerverschalung mit dem Schiffskörper schwimmt nach dem Stapellauf in der in Fig. 3 dargestellten Lage kieloben. Die Luft tritt allmählich durch die Löcher 6 im Boden der Verschalung und des Schiffskörpers aus, und das Wasser dringt in den Mittelraum und in die Räume oberhalb der Schotten 5 ein. Hierbei sinkt der Ponton mit dem Schiffskörper in die in Fig. 4 gezeichnete labile Lage, in welcher Punkt 7 den Schwerpunkt und Punkt 8 den Angriffspunkt des Auftriebes bedeuten. Da die Schotten 5 unten liegen und der schwere Boden oben, so befindet sich der Körper in der labilen Gleichgewichtslage, und zwar bei der dargestellten Bemessung von Schotten und Fassungsraum dann, wenn nach der vollständigen Entlüftung der Körper fast bis zum Kiel eingetaucht. Aus dieser Lage (Fig. 4) kann der Körper leicht in die in den Fig. 5 bis 7 dargestellten Lagen umgedeutet werden. Da nach

[geen verplanten vlei er]

labile evenwichtslage

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Fig. 7 der Körper in die Lage gelangt, in welcher die Oberkanten über Wasser gehalten werden, so kann das Wasser nach dem Umwenden leicht ausgepumpt werden. Die Luftauslaßlöcher 6 können mit Rückschlagventilen versehen werden.

PATENT-ANSPRUCH:

- Verfahren zur Herstellung von Eisenbetonschiffen in der Lage kieloben, dadurch gekennzeichnet, daß der Schiffskörper

per auf einer als Ponton wirkenden, mit Luft erfüllten Räumen versehenen Verschalung geformt wird, die mit dem fertigen Schiffskörper vom Stapel läuft und ihn zunächst kieloben schwimmfähig erhält, darauf aber infolge Entlüftung der lufterfüllten Räume durch Eindringen von Wasser derartig beschwert wird, daß das angenähert bis zum Kiel gesunkene Schiff in labilen Gleichgewichtszustand gerät und sich selbsttätig in die aufrechte Lage wendet.

Hierzu 1 Blatt Zeichnungen.

Zu der Patentschrift 339777
Kl. 65a Gr. 3

Fig. 1.

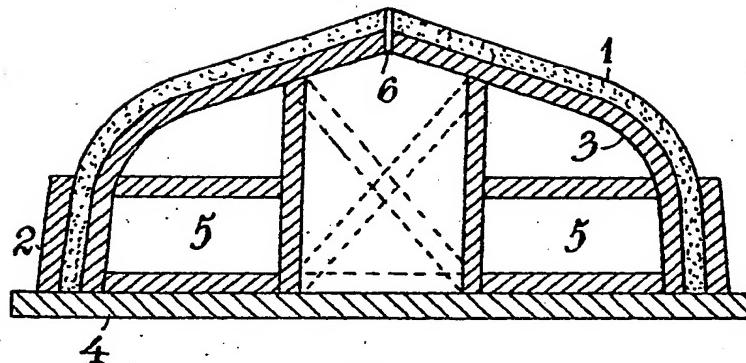


Fig. 2.

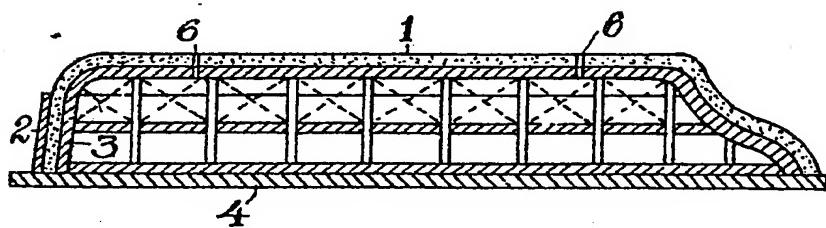


Fig. 3.

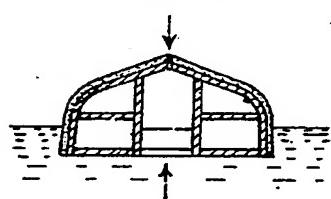


Fig. 4

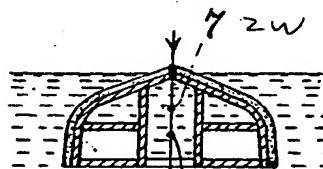


Fig. 5.

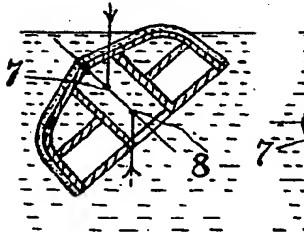


Fig. 6.

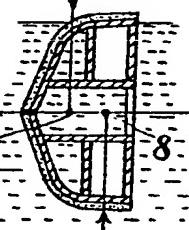
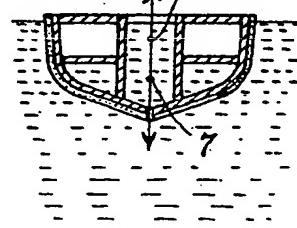


Fig. 7.



PHOTOGR. DRUCK DER REICHSDRUCKEREI

PATENT

SPECIFICATION.



Convention Date (Norway), Aug. 11, 1916.

Application Date (in the United Kingdom), May 17, 1917. No. 7108/17.

Complete Accepted, Nov. 22, 1917.

COMPLETE SPECIFICATION.

Improvements in connection with the Building and Launching of Reinforced Concrete Boats.

I, HARALD ALFSEN, Civil Engineer, of Porsgrund, Norway, do hereby declare the nature of this invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

5 The present invention relates to improvements in connection with the building and launching of reinforced concrete boats.

In the ordinary method of construction craft of this type are cast in an upright position between suitable lathings and launched as an ordinary ship. The casting of floating craft in this way is, however, a costly and difficult process, as it becomes necessary to provide extensive lathing both inside and outside the hull, and this again makes it difficult to place the reinforcement and keep the same in position during the casting operation.

10 These difficulties are obviated if the craft is cast in an inverted position with the bottom up on an interior lathing forming a permanent but easily dis-

15 mountable structure.

It has previously been proposed to cast smaller craft of concrete in an inverted position in plaster-mould, but the method has been found unpracticable owing to the difficulties of turning over the craft after the casting without injuring the same.

20 According to the present invention all the difficulties of turning over the craft are obviated by launching the same in its inverted position and performing the turning over when the craft is floating.

In order to carry out this method in the best possible way, the displacement of the boat when filled with water is so proportioned to the total weight of 25 the same that it will just be awash when the air inside the hull has been displaced by water.

The right conditions may be obtained by regulating the volume of the inside lathing which is launched with the boat so that its buoyancy is just sufficient to carry the concrete hull, or a number of airtight compartments may be conveniently placed in the craft.

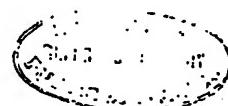
30 Air outlets are provided in the bottom of the hull. The deck may be cast after the boat has been launched or it may be cast together with the rest of the hull.

In the accompanying sheet of explanatory drawings:

35 Figure 1 is a cross section through a boat and its lathings before the launching;

Figure 2 is a longitudinal section on a smaller scale; and

[Price .6d.]



Figures 3 to 7 show cross sections of the boat after the launching and on different stages of the turning-over process.

1 is the hull, 2 and 3 the outside and inside lathing, and 4 is the platform on which the boat is built. Airtight compartments 5 are provided on each side of the hull and air-outlets 6 in the bottom of the same.

The outside lathing is arranged so that it extends along the vertical sides of the boat only, while the hull is cast or plastered on the interior lathing only. The latter may consist of large boards or sections which fit together to form a definite structure and may be easily taken apart for use in casting new ships of the same type.

After the ship has been launched it will first float in the position shown on Figure 3, but as the air is let out through the holes 6 in the bottom and displaced by water, it will sink till it arrives in the position shown on Figure 4 in which the ship's weight is equalized by its buoyancy.

As the airtight compartments in this position are in the lowest part of the ship while the heavy bottom is at the top, it is evident that its equilibrium will be unstable, and it will therefore have a tendency to turn over on its own accord as shown on Figures 5 and 6, the points 7 and 8 on Figures 4—7 indicating the centre of gravity and the centre of buoyancy of the ship, during this movement.

It is preferred to make the buoyancy of the ship sufficient to keep the gunwale well above the water line so that the water may be pumped out after the launching operation has been performed.

The airholes may, if desired, be provided with non-return valves.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

(1) The improved method of building and launching reinforced concrete boats for enabling them to be launched when in an inverted position and then to automatically reverse this position when afloat in the water after launching, substantially as hereinbefore described.

(2) The improvements in connection with the construction and launching of floating craft or vessels from reinforced concrete, consisting of an arrangement of interior lathing or framework that will permit of the vessel being moulded or formed with the bottom of the hull uppermost, and that will enable it to remain within the vessel when such is launched in an inverted position.

(3) In a method of building and launching boats as claimed in Claim 1, providing holes for the escape of air in the bottom of the ship, said holes being provided when necessary, with non-return valves to prevent the entrance of water through the same after the craft has been turned over.

(4) In a method of building and launching boats as claimed in Claim 1, proportioning the hull and lathing so that the total buoyancy of the same is just sufficient to keep the craft awash when the air has escaped from the hull.

(5) In a method of building and launching boats as claimed in Claim 1, providing bodies of large buoyancy, such as airtight compartments or the like, located in such a position that the equilibrium of the craft when awash in an inverted position becomes unstable or indifferent.

(6) The method of building and launching reinforced concrete boats, substantially as hereinbefore described and as illustrated in the accompanying drawings.

Dated this 17th day of May, 1917.

MARKS & CLERK.

[This Drawing is a reproduction of the Original on a reduced scale]

FIG. 1.

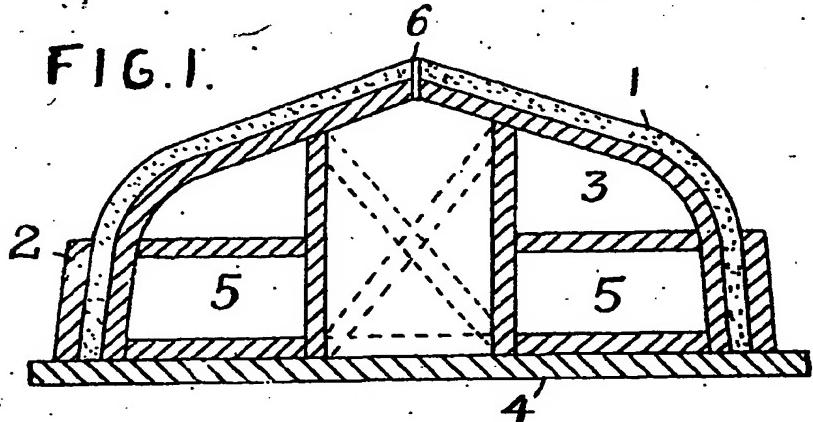


FIG. 2.

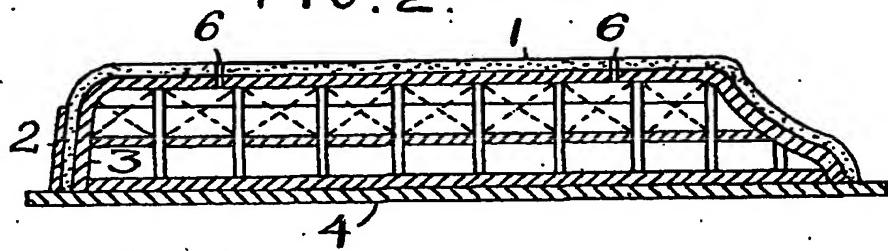


FIG. 3.

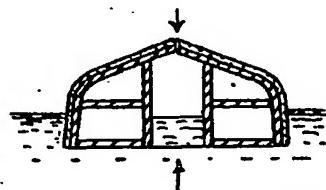


FIG. 4.

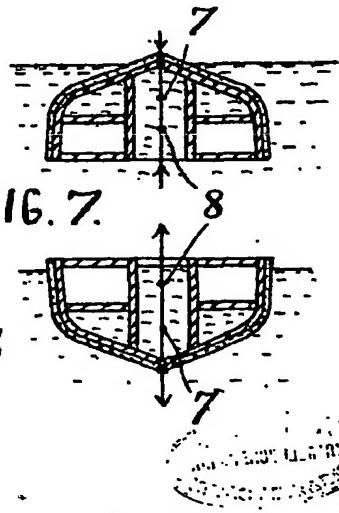


FIG. 5.

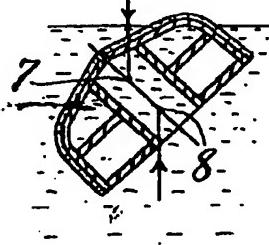


FIG. 6.

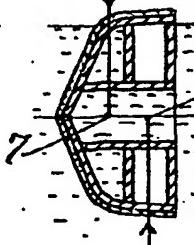


FIG. 7.

